**Department of Public Works**
**Engineering Division**

March 2, 2012

Bruce Wolfe, Executive Officer
Regional Water Quality Control Board, San Francisco Bay Region
1515 Clay Street, Suite 1400
Oakland, CA 94612

Re: Submittal of Baseline Trash Load and Short-Term Trash Load Reduction Plan

Dear Mr. Wolfe:

Enclosed for your review is the City of Berkeley's Baseline Trash Load and Short-Term Trash Load Reduction Plan as required by Provisions C.10.a(i) and C.10.a(ii) of the Municipal Regional Stormwater NPDES Permit for the Alameda Countywide Clean Water Program (NPDES Permit R2-2009-0074).

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision or were prepared by our consultants or consultants of the Alameda Countywide Clean Water Program in accordance with a system designed to assure that qualified personnel gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those people directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and as complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for known violations.

If you have any questions, please contact Danny Akagi, Associate Civil Engineer at 981-6394, Lorin Jensen, Supervising Civil Engineer at 981-6411.

Sincerely,

Andrew Clough
Director of Public Works

Enclosure: Baseline Trash Load and Short-Term Load Reduction Plan

**1947 Center Street, 4TH Floor, Berkeley, CA 94704-1155 Tel: 510.981-6400 TDD: 510.981-6903 Fax: 510.981.6390**
**E-mail: publicworks@ci.berkeley.ca.us**

# Baseline Trash Load and Short-Term Trash Load Reduction Plan

**Submitted by:**

**Department of Public Works**

**2180 Milvia Street, 3rd Floor**

**Berkeley, CA 94704**

*In compliance with Provisions C.10.a(i) and C.10.a(ii) of Order R2-2009-0074*

March 2, 2012

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# City of Berkeley
# SHORT-TERM TRASH LOAD REDUCTION PLAN

## CERTIFICATION STATEMENT

"I certify, under penalty of law, that this document and all attachments were prepared either under my direction or supervision, or were prepared by our consultants or consultants of the Alameda Countywide Clean Water Program in accordance with a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted, is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

**Signature by Duly Authorized Representative:**

Andrew Clough
Director of Public Works

March 2, 2012

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# ABBREVIATIONS

| | |
|---|---|
| BASMAA | Bay Area Stormwater Management Agencies Association |
| BID | Business Improvement District |
| CalRecycle | California Department of Resources Recycling and Recovery |
| Caltrans | California Department of Transportation |
| CASQA | California Stormwater Quality Association |
| CDS | Continuous Deflection Separator |
| CEQA | California Environmental Quality Act |
| CY | Cubic Yards |
| EIR | Environmental Impact Report |
| EPA | Environmental Protection Agency |
| GIS | Geographic Information System |
| MRP | Municipal Regional Stormwater NPDES Permit |
| MS4 | Municipal Separate Storm Sewer System |
| NGO | Non-Governmental Organization |
| NPDES | National Pollutant Discharge Elimination System |
| Q | Flow |
| SFRWQCB | San Francisco Regional Water Quality Control Board |
| SWRCB | State Water Resource Control Board |
| TMDL | Total Maximum Daily Load |
| USEPA | United States Environmental Protection Agency |
| Water Board | San Francisco Regional Water Quality Control Board |
| WDR | Waste Discharge Requirements |

# PREFACE

This Baseline Trash Load and Short-Term Trash Load Reduction Plan (Plan) is submitted in compliance with provision C.10.a(i) and C.10.a(ii)of the Municipal Regional Stormwater NPDES Permit (MRP) for Phase I communities in the San Francisco Bay (Order R2-2009-0074). This Plan was developed using a regionally consistent format developed by the Bay Area Stormwater Management Agencies Association (BASMAA). Based on new information that becomes available during the implementation of this Short-Term Plan (e.g., revisions to baseline loading estimates or load reduction credits of quantification formulas), the City of Berkeley may choose to amend or revise this Plan. If revisions or amendments are necessary, a revised Short-Term Plan will be submitted to the Water Board via the City of Berkeley's annual reporting process.

# 1.0 INTRODUCTION

The Municipal Regional Stormwater NPDES Permit for Phase I communities in the San Francisco Bay (Order R2-2009-0074), also known as the Municipal Regional Permit (MRP), became effective on December 1, 2009. The MRP applies to 76 large, medium and small municipalities (cities, towns and counties) and flood control agencies in the San Francisco Bay Region, collectively referred to as Permittees. Provision C.10 of the MRP (Trash Load Reduction) requires Permittees to reduce trash from their Municipal Separate Storm Sewer Systems (MS4s) by 40 percent before July 1, 2014.

Required submittals to the San Francisco Bay Regional Water Quality Control Board (Water Board) by February 1, 2012 under MRP provision C.10.a (Short-Term Trash Loading Reduction Plan) include:

1. (a) Baseline trash load estimate, and (b) description of the methodology used to determine the load level.
2. A description of the Trash Load Reduction Tracking Method that will be used to account for trash load reduction actions and to demonstrate progress and attainment of trash load reduction levels.
3. A **Short-Term Trash Loading Reduction Plan** that describes control measures and best management practices that will be implemented to attain a 40 percent trash load reduction from its MS4 by July 1, 2014;

This Short-Term Trash Load Reduction Plan (Short-Term Plan) is submitted by the City of Berkeley in compliance with the portions of MRP provision C.10.a.i listed as 1a and 3 above. In compliance with 1b, BASMAA submitted a progress report on behalf of Permittees that briefly describes the methodologies used to develop trash baseline loads (BASMAA 2011a). These methods are more fully described in BASMAA (2011b, 2011c). Lastly, the *Trash Load Reduction Tracking Method Technical Report* (BASMAA 2011d) was submitted by BASMAA on behalf of Permittees in compliance with submittal 2 described above. The Baseline Loading Rates and Tracking Method projects are briefly described below.

## Baseline Trash Generation Rates Project

Through approval of a BASMAA regional project, Permittees agreed to work collaboratively to develop a regionally consistent method to establish baseline trash loads from their MS4s. The project, also known as the *BASMAA Baseline Trash Generation Rates Project* assists Permittees in establishing a baseline to demonstrate progress towards MRP trash load reduction goals (i.e., 40 percent). The intent of the project was to provide a scientifically-sound method for developing (default) baseline trash generation rates that can be adjusted, based on Permittee/site specific conditions; and used to develop baseline loading rates and loads. Baseline loads form the reference point for comparing trash load reductions achieved through control measure implementation.

Baseline trash loading rates are quantified on a volume per unit area basis and based on factors that significantly affect trash generation (e.g., land use, population density, and economic profile). The method used to the establish baseline trash loads for each Permittee builds off "lessons learned" from previous trash loading studies conducted in urban areas (Allison and Chiew 1995; Allison et al. 1998; Armitage et al. 1998; Armitage and Rooseboom 2000; Lippner et al. 2001; Armitage 2003; Kim et al. 2004; County of Los Angeles 2002, 2004a, 2004b; Armitage 2007). The method is based off a conceptual model developed as an outgrowth of these studies (BASMAA 2011b). Baseline trash loading rates were developed through the quantification and characterization of trash captured in Water Board recognized

full-capture treatment devices installed in the San Francisco Bay area. Methods used to develop trash baseline loading rates are more fully described in BASMAA (2011b, 2011c, and 2012).

## Trash Load Reduction Tracking Method Summary

The trash load reduction tracking method, described in the *Trash Load Reduction Tracking Method Technical Report,* assists Permittees in demonstrating progress towards reaching trash load reduction goals defined in the MRP (e.g., 40 percent). The tracking method is based on information gained through an extensive literature review and Permittee experiences in implementing stormwater control measures in the San Francisco Bay Area. The literature review was conducted to evaluate quantification methods used by other agencies to assess control measure effectiveness or progress towards quantitative goals. Results are documented in the *Trash Load Reduction Tracking Method: Technical Memorandum # 1 – Literature Review* (BASMAA 2011d).

Methods attributable to specific trash control measures fall into two categories: 1) trash load reduction quantification formulas; and 2) load reduction credits (BASMAA 2012b). Quantification formulas were developed for those trash control measures that were deemed feasible and practical to quantify load reductions at this time. Load reduction credits were developed for all other control measures included in the methodology development. Both categories of methods assume that as new or enhanced trash control measures are implemented by Permittees, a commensurate trash load reduction will occur. Progress towards load reduction goals will be demonstrated through comparisons to established trash baseline load estimates developed through the BASMAA *Baseline Generation Rates Project*.

## Short-Term Trash Load Reduction Plan

The purpose of this Short-Term Plan is to describe the current level of implementation of control measures and best management practices, and identify the type and extent to which new or enhanced control measures and best management practices will be implemented to attain a 40 percent trash load reduction from their MS4 by July 1, 2014. The Short-Term Plan was developed using a template created by BASMAA through a regional project. New and enhanced trash control measures (i.e., Best Management Practices) that Permittees may implement to demonstrate trash load reduction goals are included in Table 1.1. This list was developed collaboratively through the BASMAA Trash Committee, which included participation from Permittee, stormwater program, Water Board and non-governmental organization (NGO) staff. The list of control measures is based on: 1) the potential for Permittees to implement; 2) the availability of information required to populate formulas and develop credits; and 3) the expected benefit of implementation. Load reductions associated with each control measure are demonstrated either through a quantification formula (QF) or credits (CR) described in the *Trash Load Reduction Tracking Method Technical Report* (BASMAA 2012b).

In efforts to reduce trash discharged from MS4s, Permittees may choose to implement control measures that are not included in Table 1.1 or described more fully in BASMAA (2011e). If a Permittee chooses to do so, methods specific to calculating trash load reductions for that control measure would need to be developed. Additionally, at that point, consideration should be given to updating this Short-Term Plan.

Additionally, based on new information that becomes available during the implementation of this Short-Term Plan (e.g., revisions to baseline loading estimates or load reduction credits of quantification formulas), the City of Berkeley may amend or revise this Plan. If revisions or amendments are necessary,

a revised Short-Term Plan will be submitted to the Water Board via the City of Berkeley's annual reporting process.

**Table 1.1.** Trash control measures for which load reduction quantification credits or formulas were developed to track progress towards trash load reduction goals.

| **Load Reduction Credits** |
|---|
| Single-use Carryout Plastic Bag Ordinances |
| Polystyrene Foam Food Service Ware Ordinances |
| Public Education and Outreach Programs |
| Activities to Reduce Trash from Uncovered Loads |
| Anti-Littering and Illegal Dumping Enforcement Activities |
| Improved Trash Bin/Container Management Activities |
| Single-Use Food and Beverage Ware Ordinances |
| **Quantification Formulas** |
| On-land Trash Pickup (Volunteer and/or Municipal) |
| Enhanced Street Sweeping |
| Partial-Capture Treatment Devices |
| Enhanced Storm Drain Inlet Maintenance |
| Full-Capture Treatment Devices |
| Creek/Channel/Shoreline Cleanups (Volunteer and/or Municipal) |

This Short-Term Plan is organized into the following sections:

- Introduction;
- Trash Baseline Load Estimate;
- Load Reduction Calculation Process
- Planned Implementation of New or Enhanced Control Measures;
- Implementation Schedule; and
- References

# 2.0 BASELINE TRASH LOADING ESTIMATE

This section provides the estimated annual trash baseline load from the City of Berkeley's Municipal Separate Storm Sewer System (MS4). In compliance with Provision C.10.a.ii of the MRP, the City of Berkeley worked collaboratively with other MRP Permittees through BASMAA to develop data and the process necessary to establish baseline trash loading estimate from our MS4. The collaborative project was managed through the BASMAA Trash Committee and included a series of steps described in BASMAA (2012) and listed below. The approach was intended to be cost-effective and consistent, but still provide an adequate level of confidence in trash loads from MS4s, while acknowledging that uncertainty in trash loads still exists. The approach entailed the following steps:

1. Conduct literature review;
2. Develop conceptual model;
3. Develop and implement sampling and analysis plan;
4. Test conceptual model;
5. Develop and apply default trash **generation rates** to Permittee effective loading areas;
6. Adjust default trash generation rates based on baseline levels of control measure implementation by the Permittee to develop trash **baseline loading rates**; and,
7. Calculate Permittee-specific annual trash **baseline load**.

Through the collaborative BASMAA project, default baseline trash generation rates (volume per area) were developed for a finite set of categories, based on factors that significantly affect trash loads (e.g., land use). These trash generation rates were then applied to effective loading areas in applicable jurisdictional areas within the City of Berkeley. Trash generation rates were then adjusted based on baseline street sweeping, storm drain inlet maintenance, and stormwater pump station maintenance conducted in each applicable area. The sum of the trash loads (i.e., rate multiplied by area) from each effective loading area represents the City of Berkeley's baseline trash load from its MS4. A full description of the methods by which trash baseline loads were developed is included in BASMAA (2012a) and is summarized below.

## Permittee Characteristics

Incorporated in 1878, the City of Berkeley covers 6,952 acres in Alameda County, and has a jurisdictional area of 5,873 acres. According to the 2010 Census, it has a population of 112,580, with a population density of 10752.1 people per square mile, and average household size of 2.17. Of the 112,580 who call the City of Berkeley home, 12.3% are under the age of 18, 26.9% are between 18 and 24, 26.9% are between 25 and 44, 22.2% are between 45 and 65, and 11.7% are 65 or older.

Top employers in the City of Berkeley include University of California, Berkeley, Lawrence Berkeley National Laboratory, Alta Bates Summit Medical Center, City of Berkeley, and Bayer. The median household income was $44,485 in 2000[2].

## Default Trash Generation Rates (Regional Approach)

[2] From the 2000 Census. The median household income for the City of Berkeley from the 2010 Census is not currently available.

A set of default trash generation rates was developed via the BASMAA regional collaborative project (BASMAA 2012b). Default generation rates were developed based on a comparison between trash characterization monitoring results, land uses, economic profiles, and other factors that were believed to possibly affect trash generation. Three trash characterization monitoring events were scheduled via the *Trash Loading Rates Project*. Due to the compliance timeline in the MRP, only two of three trash characterization monitoring events were used to develop trash generation rates described in BASMAA (2012a) and presented in this section. Following the completion of the third characterization event (Winter 2011/12), this section of the Short-Term Plan may be updated to reflect the most up-to-date trash generation and loading rates available. Trash generation rates based on the results of two of the three characterization events are shown in Table 2-1 for each trash loading category.

**Table 2-1: Regional Default Annual Trash Generation Rates by Land Use Category.**

| Land Use Category | Generation Rates (Gallons/Acre) |
|---|---|
| Retail and Wholesale | 29.99 |
| High Density Residential | 17.04 |
| K-12 Schools | 13.14 |
| Commercial and Services/ Heavy, Light and Other Industrial | 7.08 |
| Urban Parks | 2.14 |
| Low Density Residential | 1.25 |
| Rural Residential | 0.17 |

## Jurisdictional and Effective Loading Areas

Default trash baseline generation rates presented in Table 2-1 were applied to effective loading areas with **jurisdictional areas** within the City of Berkeley. The City of Berkeley's jurisdictional areas includes all urban land areas within the City of Berkeley boundaries that are subject to the requirements in the MRP. Land use areas identified by a combination of the ABAG 2005 land use dataset and Permittee knowledge that were not included within the City's jurisdictional areas include:

- Federal and State of California Facilities and Roads (e.g., Interstates, State Highways, Military Bases, Prisons);
- Roads Owned and Maintained by Alameda County;
- Colleges and Universities (Private or Public);
- Non-urban Land Uses (e.g., agriculture, forest, rangeland, open space, wetlands, water);
- Communication or Power Facilities (e.g., PG & E Substations);
- Water and Wastewater Treatment Facilities; and
- Other Transportation Facilities (e.g., airports, railroads, and maritime shipping ports).

Once the City of Berkeley's jurisdictional area was delineated, an effective trash loading area was developed by creating a 200-foot buffer around all streets within the City's jurisdictional area. The purpose of the effective loading area is to eliminate land areas not directly contributing trash to the

City's MS4 (e.g., large backyards and rooftops). Both the jurisdictional and the effective loading areas for the City of Berkeley are presented in Table 2-2.

**Table 2-2: Jurisdictional areas and effective loading areas in the City of Berkeley by land use classes identified by ABAG (2005).**

| Land Use Category | Jurisdictional Area (Acres) | Effective Loading Area (Acres) | % of Effective Loading Area |
|---|---|---|---|
| High Density Residential | 1,827 | 1,825 | 33 |
| Low Density Residential | 2,536 | 2,499 | 45 |
| Rural Residential | 20 | 12 | 0 |
| Commercial and Services/ Heavy, Light and Other Industrial | 759 | 722 | 13 |
| Retail and Wholesale | 268 | 262 | 5 |
| K-12 Schools | 97 | 82 | 1 |
| Urban Parks | 446 | 130 | 2 |
| **TOTAL** | 5,954 | 5,533 | **100%** |

## Permittee-Specific Baseline Trash Loading Rates

Regional default trash generation rates developed through the BASMAA regional collaborative project were applied to effective loading areas within the City of Berkeley based on identified land uses. These generation rates were then adjusted based on the calculated effectiveness of baseline street sweeping, storm drain inlet maintenance and pump station maintenance implemented by the City. These adjustments were conducted in GIS due to the site specificity of baseline generation rates and baseline control measure implementation. The following sections describe the baseline level of implementation for these three control measures. A summary of trash baseline generation and loading rates for the City of Berkeley are provided in Table 2-3 and areas associated with these rates are illustrated in Figure 2-1.

### *Baseline Street Sweeping*

A "baseline" street sweeping program is defined as the sweeping frequency and parking enforcement implemented by the City of Berkeley prior to effective date of the MRP. Baseline street sweeping differs from "enhanced" street sweeping, which includes increased parking enforcement and/or sweeping conducted at a frequency greater than baseline ceiling (i.e., once per week for retail land uses and twice per month for all other land uses). The baseline ceiling was created to not penalize implementers of enhanced street sweeping programs prior to the effective date of the MRP. For those Permittees that sweep less frequent than the baseline ceiling, their current sweeping frequency serves as their baseline.

The City of Berkeley's baseline street sweeping program includes sweeping most streets in residential areas once per month. Downtown streets and most arterial roads have a baseline sweeping frequency of once per week or twice per month. The downtown area, retail areas, and arterial roads are swept at a variety of frequencies including every day, five times per week, four times per week, three times per

week, twice per week, and twice per month. Many streets in the City, especially in the Berkeley hills, are not swept (see QF-2).

Nearly all streets that are swept have either street sweeping signs posted or have a parking enforcement equivalent. The estimated trash load reduced via baseline street sweeping is presented in Table 2-3.

### *Baseline Storm Drain Inlet Maintenance*

Within the City, storm drain inlets were cleaned at a baseline level of one time per year prior to the effective date of the MRP. Based on this baseline frequency and the effectiveness rating developed in BASMAA (2012b), the baseline storm drain maintenance program in the City of Berkeley has an annual effectiveness rating of 5%. The estimated trash load reduced via baseline storm drain inlet maintenance is presented in Table 2-3.

### *Baseline Stormwater Pump Station Maintenance*

The City of Berkeley does not own any stormwater pump stations with trash racks.

## Baseline Trash Loading Estimate

The estimated baseline trash load from the City of Berkeley was calculated as the sum of the loads from the City's effective loading area, adjusted for baseline implementation of street sweeping, storm drain inlet maintenance, and pump station maintenance. The preliminary annual trash baseline load for the City of Berkeley is presented in Table 2-3. Preliminary baseline trash loading rates are presented in Figure 2-1 to provide a geographical illustration of areas with estimated low, moderate, high and very high trash loading rates.

**Table 2-3: Preliminary annual trash baseline load for the City of Berkeley.**

| Category | Annual Load (gallons) |
|---|---|
| Preliminary Generation Trash Load | 48,566 |
| Load Removed via Baseline Street Sweeping | 21,981 |
| Load Removed via Baseline Storm Drain Inlet Maintenance | 1,329 |
| Load Removed via Baseline Stormwater Pump Station Maintenance | 0 |
| **Preliminary Trash Baseline Load** | **25,256** |

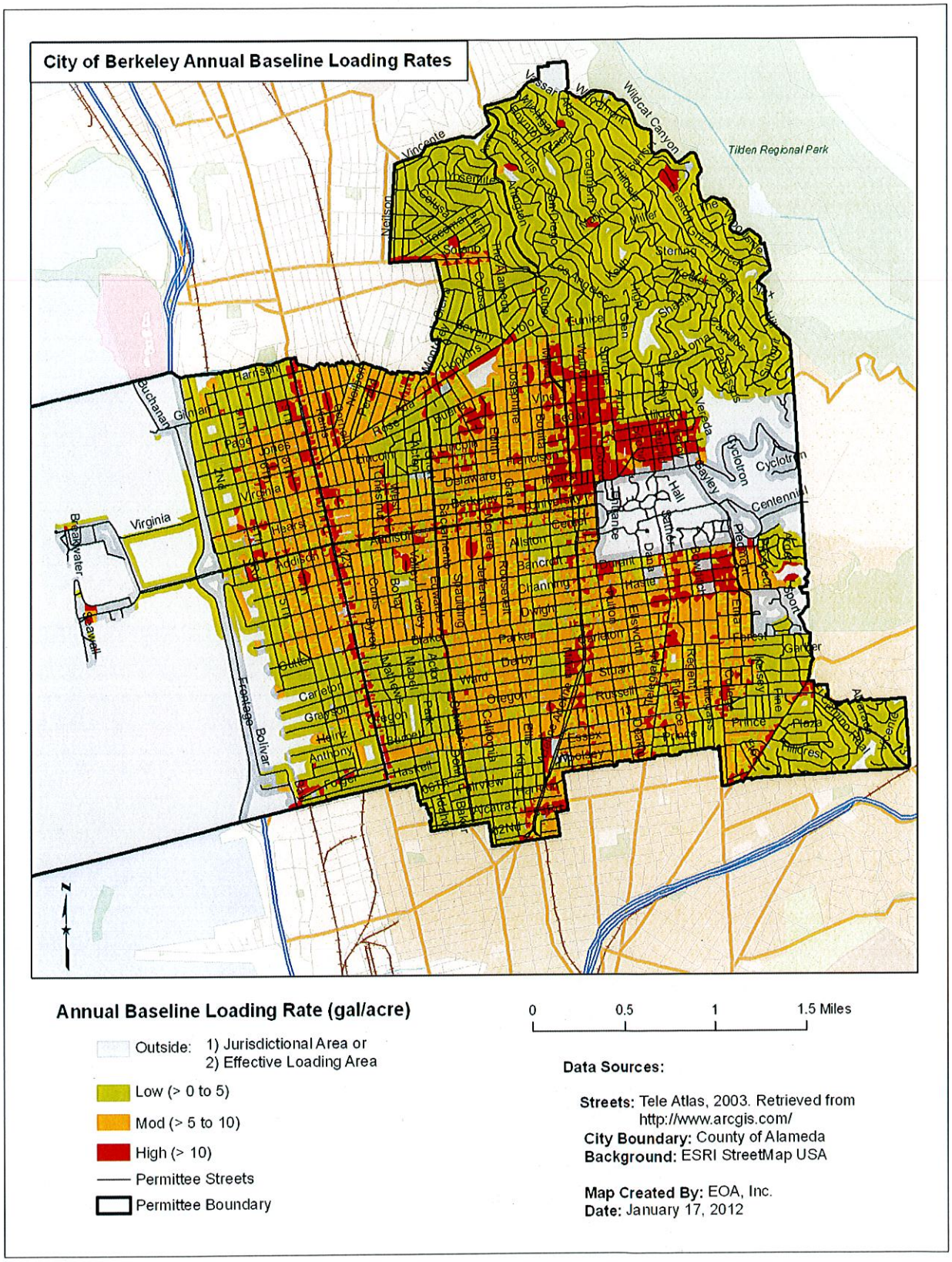


**Figure 2-1: Estimated trash baseline loading rates for geographical areas in the City of Berkeley.**

# 3.0 LOAD REDUCTION CALCULATION PROCESS

Using the guiding principles and assumptions described BASMAA (2012b), a stepwise process for calculating trash load reductions was developed collaboratively through BASMAA. This process is fully described in Trash Load Reduction Tracking Method Technical Report (BASMAA 2012b) and is briefly summarized in this section. The process takes into at what point in the trash generation and transport process a trash control measure: 1) prevents trash generation, 2) intercepts trash in the environment prior to reaching a water body, or 3) removes trash that has reached a water body. In doing so, it avoids double-counting of trash load reductions associated with specific control measures.

To demonstrate trash load reductions, baseline trash loading rates will be adjusted using the following process:

**Step #1:** Existing Enhanced Street Sweeping
**Step#2:** Trash Generation Reduction
**Step #3:** On-land Interception
**Step #4:** Trash Interception in the Stormwater Conveyance System
**Step #5:** Trash Interception in Waterways
**Step #6:** Comparison to Baseline Trash Load

Reductions calculated in Steps 2 and 5 are assumed to be implemented at a constant rate on an "area-wide" basis. For example, if a new region-wide public education strategy is implemented within the San Francisco Bay area, all Permittees can apply load reduction credits associated with this control measure. In contrast, Steps 1, 3 and 4 are "area-specific" reductions that only apply to specific areas within a Permittee's jurisdiction. Area-specific control measures include full-capture treatment devices and enhanced street sweeping. Area-specific reductions may require the use of a Geographic Information System (GIS) to calculate.

Reductions are generally applied in the sequence as presented in Figure 2-1 and described below, although some reductions may be applied "in-parallel" and calculated during the same sub-step in the process.

## Step #1: Existing Enhanced Street Sweeping

Trash load reductions due to existing enhanced street sweeping implemented prior to the effective date of the MRP and conducted at levels above baseline levels are not incorporated into each Permittee's trash baseline load. Therefore, load reductions associated with existing enhanced are accounted for first in the trash load reduction calculation process. Existing enhanced street sweeping includes street sweeping conducted at a frequency greater than **1x/week** for streets within retail land use areas or greater than **2x/month** for streets in all other land use areas. The result of adjustments made to trash baseline loads due to the implementation of existing enhanced street sweeping is a set of **current baseline loading rates** and a **current baseline load**.

## Step #2: Trash Generation Reduction Control Measures

Trash generation reduction control measures prevent or greatly reduce the likelihood of trash from being deposited onto the urban landscape. They include the following area-wide control measures:

CR-1: Single-Use Carryout Plastic Bag Ordinances

CR-2: Polystyrene Foam Food Service Ware Ordinances

CR-3: Public Education and Outreach Programs

CR-4: Reduction of Trash from Uncovered Loads

CR-5: Anti-Littering and Illegal Dumping Enforcement

CR-6: Improved Trash Bin/Container Management

CR-7: Single-Use Food and Beverage Ware Ordinances

Load reductions associated with trash generation reduction control measures are applied on an area-wide basis.[3] Therefore, reductions in current baseline loading rates are adjusted uniformly based on the implementation of the control measure and the associated credit claimed.

Baseline loading rate adjustments for all generation reduction controls measures implemented may be applied in-parallel, but should be applied prior to calculating on-land interception measures discussed in Step #3. The result of adjustments to trash baseline loading rates due to the implementation of these enhanced control measures will be a set of **street loading rates**. The **street load** is the volume of trash estimated to enter the environment and available for transport to the MS4 if not intercepted via on-land control measures described in Step #2.

## Step #3: On-land Interception Control Measures

Once trash enters the environment, it may be intercepted and removed through the following control measures prior to reaching the stormwater conveyance system:

QF-1: On-land Trash Cleanups (Volunteer and/or Municipal) (Area-wide)

QF-2: Enhanced Street Sweeping (Area-specific)

Since on-land trash cleanups can affect the amount of trash available to street sweepers, load reductions associated with their implementation will be quantified first, followed by street sweeping enhancements. On-land trash cleanups will be applied as an area-wide reduction and all effective loading rates will be adjusted equally. Enhanced street sweeping, however, is an area-specific control measure and only those effective loading rates associated with areas receiving enhancements will be adjusted. Due to the spatial nature of enhanced street sweeping, GIS may be needed to conduct this step.

The result of adjustments to effective loading rates due to the implementation of these enhanced control measures will be a set of **conveyance system loading rates**. The **conveyance load** is the volume of trash estimated to enter the stormwater conveyance system (e.g., storm drains).

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[3] The only exception to this statement are load reductions associated with the establishment of Business Improvement Districts (BIDs) or equivalent, which are specific to geographic areas and considered "area-specific".

## Step #4: Control Measures that Intercept Trash in the MS4

Control measures that intercept trash in the stormwater conveyance system are area-specific. Therefore, they only apply to land areas and associated trash loads reduced. Conveyance system loading rates developed as a result of Step #3 should be adjusted in-parallel for the following control measures:

- QF-3a: Partial-capture Treatment Device: Curb Inlet Screens (Area-specific)
- QF-3b: Partial-capture Treatment Device: Stormwater Pump Station Trash Racks Enhancements (Area-specific)
- QF-4: Enhanced Storm Drain Inlet Maintenance (Area-specific)
- QF-5: Full-Capture Treatment Devices (Area-specific)

Load reductions for these control measures are calculated in-parallel because they are applied to independent geographical areas. Reductions from all control measures described in this step are area-specific and may require the use of GIS to calculate a set of **waterway loading rates**. Once waterway loading rates have been determined, a **waterway load** will be developed and used as a starting point for calculating load reductions associated with trash interception in waterways discussed in Step #5.

## Step #5: Control Measures that Intercept Trash in Waterways

The load of trash that passes through the stormwater conveyance system without being intercepted may still be removed through interception in waterways. There are two control measures associated with interception in waterways:

- QF-3c: Partial-capture Treatment Device: Litter Booms/Curtains (Area-wide)
- QF-7: Creek/Channel/Shoreline Cleanups (Volunteer and/or Municipal) (Area-wide)

As these control measures are implemented, load reduction estimates can be calculated in-parallel for these two measures.

## Step #6: Comparison to Baseline Trash Load

Applying the four steps described in the processes above will provide an estimated trash load (volume) remaining after trash control measures are implemented. As depicted in the following equation, the relative percent difference between the baseline load and the load remaining after control measures are implemented is the percent reduction that will be used to assess progress towards MRP trash load reduction goals.

$$\frac{\text{Baseline Load} - \text{Remaining Load}}{\text{Baseline Load}} = \%\ \text{Reduction}$$

# 4.0 ENHANCED TRASH CONTROL MEASURES

This section describes the new or enhanced trash control measures planned for implementation by the City of Berkeley. The enhanced control measures described are designed to reach a 40% reduction by July 1, 2014. New and enhanced control measures that will be implemented by the City of Berkeley include those listed in Table 4.1.

**Table 4.1. Trash control measures that will be implemented by the City of Berkeley to reach the 40% trash load reduction.**

| Control Measure |
|---|
| Single-use Carryout Plastic Bag Ordinances |
| Polystyrene Foam Food Service Ware Ordinances |
| Public Education and Outreach Programs |
| Activities to Reduce Trash from Uncovered Loads |
| Improved Trash Bin/Container Management (Municipally or Privately-Controlled) |
| Enhanced Street Sweeping (Existing) |
| Full-Capture Treatment Devices |

# CR-1: Single-use Carryout Plastic Bag Policy

Single-use plastic carryout bags have been found to contribute substantially to the litter stream and to have adverse effects on marine wildlife (United Nations 2009, CIWMB 2007, County of Los Angeles 2007). The prevalence of litter from plastic bags in the urban environment also compromises the efficiency of systems designed to channel storm water runoff. Furthermore, plastic bag litter leads to increased clean-up costs for the Permittees and other public agencies.

Based on recent experiences of municipalities throughout the State, the process Permittees must go through to enact a single-use carryout plastic bag policy/ordinance is difficult due to intense scrutiny and opposition from not only public interest groups and lobbyists, but also merchants and community members. In most cases, most opposition groups are pressing for the development of Environmental Impact Reports (EIRs) in accordance with the California Environmental Quality Act (CEQA).

## Baseline Level of Implementation

Prior to adoption of the MRP, Permittees within the Bay area have enacted policies or ordinances on Single-use Carryout Plastic Bags. To avoid penalizing these early implementers, an applicable control measure implemented by a Permittee prior to the effective date of the MRP will be credited equally to a control measure implemented after the effective date. Therefore, the baseline level of implementation is not applicable for this control measure.

## Enhanced Level of Implementation

The City of Berkeley plans to adopt an ordinance prohibiting the distribution of single-use carryout plastic bags. The ordinance will enable implementing Alameda County Waste Management Authority (StopWaste.org) ordinance adopted January 25, 2012 prohibiting distribution of single-use carryout plastic bags at the cash register at retail stores covered by the ordinance and establishing a mandatory fee for other carryout bags. The ordinance will take effect on January 1, 2013 affecting all retail stores that sell packaged food in the city. Single-use plastic carryout bags are banned. A minimum fee of 10 cents will be charged for every paper carryout bag or reusable plastic carryout bag provided to the customer at the cash register. The total percent trash reduced from MS4s as a result of implementing a single-use carryout plastic bag ordinance will be reported in the Annual Report submitted each September to the Water Board.

***Tier 1 – Prohibit Distribution at Large Supermarkets*** *– Adoption of a local policy or ordinance or implementation of a statewide or countywide action that prohibits large supermarkets from distributing single-use carryout plastic bags within their jurisdictional boundaries.*

***Tier 2 – Prohibit Distribution at Retail Establishments that Sell Packaged Foods*** *– Adoption of a local policy or ordinance or implementation of a statewide or countywide action that prohibits retail establishments that sell packaged foods from distributing single-use carryout plastic bags within their jurisdictional boundaries.*

### *Reduction from Implementing Control Measure*

*The City of Berkeley will receive a 8 percent reduction credit for implementing specific enhanced control measures described in Enhanced Level of Implementation section above. The 8 percent reduction credit will be applied to* the City of Berkeley's baseline trash load. This percent reduction credit is consistent with methods presented in the BASMAA (2012b). A summary of all load reductions anticipated through the implementation of this plan are included in Section 5.0.

# CR-2: Polystyrene Foam Food Service Ware Policy

Polystyrene foam is used as food ware in the food service industry. According to the USEPA, floatable debris in waterways, such as products made of polystyrene, is persistent in the environment and has physical properties that can have serious impacts on human health, wildlife, the aquatic environment and the economy (USEPA 2002). Due to its properties, polystyrene foam used as food ware is typically not recycled. Since 1990, over 100 government agencies within the United States, including over twenty within the Bay area have enacted full or partial bans on polystyrene foam food service ware.

## Baseline Level of Implementation

Prior to adoption of the MRP, over twenty agencies within the Bay area enacted full or partial bans on polystyrene foam food service ware. To avoid penalizing these early implementers, an applicable control measure implemented by a Permittee prior to the effective date of the MRP will be credited equally to a control measure implemented after the effective date. Therefore, the baseline level of implementation is not applicable for this control measure.

## Enhanced Level of Implementation

The City of Berkeley adopted Ordinance No. 5888-N.S. satisfying the Tier 1a and Tier 1b enhanced control measures described below. This ordinance became effective January 1, 1990. The percent trash reduction from MS4s as a result of implementing a polystyrene foam food service ware ordinance will be reported in the Annual Report submitted each September.

***Tier 1a – Prohibit the distribution of polystyrene foam single-use food and beverage ware at Permittee-sponsored events or on Permittee-owned property*** *– Adoption of a local ordinance or implementation of a statewide, countywide, or regional action that prohibits food vendors from distributing polystyrene foam food and beverage ware at Permittee-sponsored events or on Permittee-owned property.*

***Tier 1b – Prohibit the distribution of polystyrene foam single-use food and beverage ware at all food service vendors*** *- Adoption of a local ordinance or implementation of a statewide, countywide, or regional action that prohibits all food vendors from distributing polystyrene foam food and beverage ware.*

## Percent Reduction from Enhancements

TheCity of Berkeley will receive a 8 percent reduction credit for implementing specific enhanced control measures described in *Enhanced Level of Implementation* section above. The 8 percent reduction credit will be applied to the City of Berkeley's baseline trash load. This percent reduction credit is consistent with methods presented in the BASMAA (2012b). A summary of all load reductions anticipated through the implementation of this plan are included in Section 5.0.

# CR-3: Public Education and Outreach Programs

Permittees in the San Francisco Bay Area have implemented public education and outreach programs to inform residents about stormwater issues relating to pollutants of concern, watershed awareness and pollution prevention. Public education and outreach efforts include developing and distributing brochures and other print media; posting messages on websites and social networking media (Facebook, Twitter etc.), attending community outreach events, and conducting media advertising. In recent years, some municipal agencies have implemented anti-litter campaigns to increase public awareness about the impacts of litter on their communities and water quality; and to encourage the public to stop littering.

## Baseline Level of Implementation

The City of Berkeley implemented the following public education and outreach control measures prior to the effective date of the MRP. These were primarily tabling at environmentally themed and general interest community events. These control measures are considered baseline because they were either not related to trash reduction specifically, or they are not planned to be continued during the term of the MRP. New actions or actions started prior to the effective date of the MRP and continued into the future are described under the next section.

## Enhanced Level of Implementation

The City of Berkeley will implement the following public education and outreach control measures prior to July 1, 2014.

**Litter Reduction Advertising Campaign(s)**

***BASMAA Youth Outreach Campaign (Regional)***

Through participation and funding of the regional **BASMAA Youth Outreach Campaign** the City of Berkeley, will implement an outreach campaign designed to reduce littering from the target audience in the Bay Area. The Youth Outreach Campaign was launched in September 2011 (post-MRP effective date) and aims to increase the awareness of Bay Area Youth (ages 16-24) on litter and stormwater pollution issues, and eventually change their littering behaviors. Combining the ideas of Community Based Social Marketing with traditional advertising, the Youth Campaign aims to engage youth to enable the peer-to-peer distribution of Campaign messages. The Campaign will at least run from FY 11-12 through FY 13-14. A brief description of the Campaign activities is provided below:

- Raising Awareness: The Campaign will begin by raising awareness of the target audience on litter and stormwater pollution issues. Partnerships with youth commissions, high schools, and other youth focused organizations will be developed to reach the target audience. Messages targeted to youth will be created and distributed via paid advertising, email marketing, Campaign website and social networking sites (e.g,, Facebook and twitter).
- Engage the Youth - The advertisements will encourage the audience to participate in the Youth Campaign by joining a Facebook page, entering a contest, taking an online quiz, etc., and providing their contact information. At the beginning of FY 12-13, a video contest will be launched to get Bay Area youth further involved in the Campaign. An

online voting system will be used to select the winning entry. Media advertising will be conducted to promote the winning entry.

- Change Behaviors: To move the audience along the behavior change continuum, the Campaign will use electronic platforms such as email marketing and social networking sites to encourage participants to engage in increasingly more difficult behavior changes, such as participating in a clean-up, organizing a clean-up, etc.
- Maintain Engagement: The Campaign will continue to interact with the target audience through email marketing and social media websites.

The Youth Campaign will include a pre and post campaign survey to evaluate the effectiveness of outreach. The pre-campaign survey will be conducted in FY 11-12 and the post campaign survey in FY 13-14. Other evaluation mechanisms, such as website hits, number of youth engaged in the Campaign's social networking website, etc. will also be used to evaluate its effectiveness in increasing awareness and changing behavior.

**Advertising campaign(s) (Countywide Program)**
Outreach to Alameda County youth may be limited by scope and budget of the BASMAA Regional Youth Campaign. Therefore the Clean Water Program will supplement the Regional Youth Outreach campaign in order to increase the number of participants in Alameda County.

## Outreach to School-age Children or Youth

The Countywide Program is currently conducting stormwater pollution prevention and anti-littering outreach to school-age children through contracts with five environmental education organizations. The current contracts expire in 2014. The Program intends to initiate new contracts for outreach to school-age children in 2014. The outreach programs will have an increased focus on anti-littering messages and will be revised to fulfill the required number of events as described in BASMAA (2012b). The City of Berkeley plans to implement this control measure through participation in the Countywide Program.

## Media Relations

***BASMAA Regional Media Relations Project (Regional)***

Through participation and funding of the **BASMAA Regional Media Relations Project**, the City of Berkeley plans to continue to implement a media relations project partially designed to reduce littering from target audiences in the Bay Area. The goal of the BASMAA Media Relations Project is to generate media coverage that encourages individuals to adopt behavior changes to prevent water pollution, including littering. At least two press releases or PSAs focus on litter issues each year (e.g., creek clean-up activities, preventing litter by using reusable containers, etc.).

**Media Relations (Countywide Program)**
Clean Water Program has already developed a media and community relations plan and contact list. The Program will regularly release articles and information to the appropriate publications, blogs and community publications on litter issues. Articles will be timed with regular events, such as Coastal Cleanup in September and the beginning of the rainy season, as well as other current events, if applicable. The media and community outreach list contains many smaller

publications and online sites as well as larger newspapers, which will increase the chances the articles are published and read. This effort goes beyond the scope of the Regional Media Relations plan by going deeper into the community through highly localized media channels.

## Percent Reduction from Enhancements

The City of Berkeley will receive a total of 6 percent reduction credit for implementing specific enhanced control measures described in *Enhanced Level of Implementation* section above. This percent reduction is comprised of the following credits, consistent with the *Load Reduction Tracking Method*:

- Litter Reduction Advertising Campaigns – 3%
- Outreach to School-age Children or Youth – 2%
- Media Relations – 1%
- Community Outreach Events -0%

These 6 percent reduction credits will be applied against the City of Berkeley's baseline trash load. This percent reduction credit is consistent with methods presented in the BASMAA (2012b). A summary of all load reductions anticipated through the implementation of this plan are included in Section 5.0

# CR-4: Reduction of Trash from Uncovered Loads

Although it is currently illegal to operate a vehicle that is improperly covered and which its' contents escapes[4], vehicles remain an important trash source to MS4s and local waterways. Specifically, vehicles that do not secure or cover their loads when transporting trash and debris have a high risk of contributing trash to MS4s. Land areas that generate trash from vehicles include roads, highways (on/off ramps, shoulders or median strips) and parking lots. To help address the dispersion of trash from unsecured or uncovered vehicles destined for landfills and transfer stations, Permittees may require municipally-contracted trash haulers to cover or secure loads or work with municipal or private landfill and transfer station operators to educate waste haulers on securing loads and/or to enhance enforcement of existing regulations.

## Baseline Level of Implementation

The baseline trash load described in Section 2.0, assumes that prior to adoption of the MRP the City of Berkeley has not adopted control measures to reduce trash from vehicles with uncovered loads. Therefore, implementation of any of the control measures described in this section is considered to be enhanced implementation.

## Enhanced Level of Implementation

The City of Berkeley will implement] the following enhanced control measures to reduce trash from vehicles with uncovered loads prior to July 1, 2014.

***Require Municipal Trash Haulers to Cover Loads*** *– Development and inclusion of language in a Permittee's hauling service contract(s) that requires contracted trash and construction debris haulers to cover loads when transporting trash and debris to municipally or privately-owned landfills and transfer stations.*

***Implement an Enhanced Enforcement Program for Vehicles with Uncovered Loads*** *– Permittees actively working with local law enforcement to establish an enhanced enforcement program for vehicles with uncovered loads. Enhanced enforcement programs may include the following:*
*-Adoption of an ordinance prohibiting the transportation of trash or debris without a cover*
*-Citations and fines for vehicles spotted on roads in an individual Permittee's jurisdictional area with uncovered loads; or,*
*-Distribution of tarps for a fee to haulers or other vehicles that arrive at landfills and transfer stations with uncovered loads. Each subsequent visit without a tarp will result in an additional fee for a tarp, prompting haulers to bring their own tarp.*

## Percent Reduction from Enhancements

[4] In accordance with the California Vehicle Code Sections 23114 and 23115, it is against the law to operate a vehicle on the highway which is improperly covered, constructed, or loaded so that any part of its contents or loads spills, drops, leaks, blows, or otherwise escapes from the vehicle. Exempted materials include hay and straw, clear water and feathers from live birds. Additionally, any vehicle transporting garbage, trash, or rubbish, used cans or bottles, waste papers, waste cardboard, etc. must have the load covered to prevent any part of the load from spilling on the highway (CVC 2011). Significant fines are possible for non-compliance.

The City of Berkeley will receive a 5 percent reduction credit for implementing specific enhanced control measures described in *Description of Enhanced Level of Implementation* section above. The 5 percent reduction credit will be applied to the baseline trash load to urban creeks from the municipal separate storm sewer system (MS4) owned and operated by the City of Berkeley. This percent reduction credit was obtained from the *Trash Load Reduction Tracking Method Report* (BASMAA 2012b) and is presented in the Trash Load Reduction Summary Table included in Section 5.

# CR-6: Improved Trash Bin/Container Management

Receptacles used to place/store trash or recyclables prior to collection by a public agency or private waste hauler reduce the potential for littering and trash loading to stormwater conveyance systems and receiving waters (City of Los Angeles 2004). For the purposes of assigning trash load reduction credits, receptacles fall into the following two categories:

- **Private Trash/Recycling Bins**: A receptacle for placing trash or recyclables generated from a household, business, or other location that is serviced by a trash hauler. Bins are specifically-designed, heavy-duty plastic wheeled containers with hinged lids; or large multi-yard metal or plastic containers rectangular in shape.
- **Public Area Trash Containers**: A receptacle for placing incidental trash generated in public spaces that provides people with a convenient and appropriate place to dispose of trash. The design and size of public area trash containers vary widely, depending on their setting and use.

The effectiveness of bins/containers and bins in reducing trash in the environment is likely dependent upon: the location and density of the receptacles, size of the bin/container in relationship to the size needed to service users, frequency of maintenance, and the ability of the bin/container to capture and contain the trash deposited.

## Baseline Level of Implementation

The baseline trash load described in Section 2.0, assumes that the City of Berkeley has not implemented enhanced trash bin/container management practices prior to effective date of the MRP. The City monitors that customers have adequately sized trash service, that public area trash containers are placed properly and are serviced frequently to prevent overflows, and works with businesses to form Business Improvement Districts that implement trash reduction measures.

## Enhanced Level of Implementation

The City of Berkeley has implemented the following improved trash bin/container management practices prior to July 1, 2014.

***Ensuring Adequate Private Trash Service*** *– Implementation of a program that identifies businesses or households that have inadequate trash service (i.e., insufficient trash collection or use of bins which are too small); and through municipal code enforcement or other authorities requiring businesses/households to sufficiently remedy the issue will receive a load reduction credit based on the extent of the program. Permittees may choose to coordinate with waste haulers to assist with the identification of subject households/businesses.*

***Implementation of Strategic Plan for Public Area Trash Containers*** *– Implementation of a strategic plan that:*
*-Identifies whether public area trash containers are sufficiently located in high trash generating areas and are adequately designed to manage trash types that typically are generated from activities occurring at these areas (e.g., containers with larger openings designed to*

*accommodate larger trash items (e.g., pizza boxes) are in locations where people dispose of these items (e.g., near schools or parks).*
*-Identifies an increased level of inspection and maintenance of public area trash containers is needed at high trash generating sites.*
*-Includes the installation of specialty trash bins/containers (e.g., bins for cigarette butts, sharps, etc.) in specific locations to eliminate or reduce the prevalence of these items in stormwater.*
*-Includes the installation of new technologies (e.g., Big Belly Solar Trash Compactors) to reduce trash in stormwater and reduce the cost of adding public area trash containers.*

*The strategic plan should provide recommendations on how the system of public area trash containers within the Permittee's jurisdictional area may be enhanced to reduce the volume of trash in streets, the stormwater conveyance system and waterways. The recommendations in the plan should begin to be implemented prior to receiving trash reduction credits associated with this control measure. Implemented plans will receive a 3 percent load reduction credit.*

***Successful Establishment of Business Improvement Districts with Trash Reduction Control Measures*** *– Provide support toward the successful establishment of Business Improvement Districts (BIDs)[5] or equivalent entity that incorporates sidewalk sweeping, litter pickup and maintenance of public area trash containers at least once per week in retail/wholesale and commercial areas. Area-specific credit of 50% will be given for each BID successfully established within a Permittee's jurisdictional area that has specific trash reduction language in the agreement. The city is including the Downtown Business Association BID (DBA, generally covers the Shattuck Ave business area), and the Telegraph Ave BID in determining trash reduction.*

## Percent Reduction from Enhancements

The City of Berkeley will receive a 6.8 percent reduction credit for implementing specific enhanced control measures described in *Description of Enhanced Level of Implementation* section above. The 6.8 percent reduction credit will be applied to the baseline trash load to urban creeks from the municipal separate storm sewer system (MS4) owned and operated by the City of Berkeley. This percent reduction credit was obtained from the *Trash Load Reduction Tracking Method Report* (BASMAA 2012b) and is presented in the Trash Load Reduction Summary Table included in Section 5.

[5] BIDs are districts or areas in central cities in which the private sector delivers services for revitalization beyond what the local government can reasonably be expected to provide. The property or business owner within the BID pays a special tax or assessment to cover the cost of services. Cities provide some oversight but the BID controls its finances.

# QF-2: Enhanced Street Sweeping

Street sweeping is conducted by most, if not all, Bay Area municipalities to remove trash and debris that collect in the gutters at the edge of streets. Parked cars and large storms that produce significant runoff can impact the effectiveness of street sweepers. However, increasing parking enforcement or more frequent street sweeping (as compared to the frequency of storm events) may increase the trash load reduced to MS4s. Permittees who choose to enhance street sweeping may do so to demonstrate trash load reductions to their MS4s and progress towards trash load reduction goals required by the MRP.

## Baseline Level of Implementation

The baseline trash load described in Section 2.0 incorporates the trash load reductions due to baseline street sweeping. The City of Berkeley's baseline street sweeping program includes sweeping at retail areas between 2 and 5 times per week and once monthly in most other areas. The City sweeps greater than baseline street sweeping ceiling frequency (i.e. >2/month non-retail and >1/week in retail) in business districts including Shattuck Avenue, Telegraph Avenue, and Solano Avenue.

## Enhanced Level of Implementation

Enhancements to street sweeping frequencies and parking enforcement (or equivalent measures) control measures will be used to calculate loads reduced from enhanced street sweeping, consistent with the trash load reduction tracking method (BASMAA 2012b).

## Percent Reduction from Enhancements

The total estimated annual volume of trash that will be reduced by July 1, 2014 as a result of existing enhanced street sweeping is 1,602 gallons. As described in Trash Load Reduction Summary Table included in Section 5, this volume is equal to approximately a 6.3 percent reduction in the baseline trash load to urban creeks from the municipal separate storm sewer system (MS4) owned and operated by the City of Berkeley.

# QF-5: Full-Capture Treatment Devices

As defined by the Municipal Regional Stormwater Permit (MRP), a full-capture system or device is any single device or series of devices that traps all particles retained by a 5 mm mesh screen and has a design treatment capacity of not less than the peak flow rate (Q) resulting from a one-year, one-hour, storm in the sub-drainage area. A list of the full-capture systems and devices recognized by the San Francisco Bay Regional Water Quality Control Board (Water Board) is included in *Trash Load Reduction Tracking Method Report* (BASMAA 2012b). Trash loads reduced via publically or privately owned and operated devices within a Permittee's jurisdictional area that have been recognized by the Water Board as full-capture may be used to demonstrate attainment of trash load reduction goals.

## Baseline Level of Implementation

Prior to adoption of the MRP, some Pemittees installed and maintained full capture devices. To avoid penalizing these early implementers, an applicable control measure implemented within a Permittee's jurisdictional area prior to the effective date of the MRP will be credited equally to a control measure implemented after the effective date. Therefore, the baseline level of implementation is no trash full-capture devices have been installed.

## Enhanced Level of Implementation

A total of 150 trash full-capture treatment devices have been or will be installed in the City of Berkeley prior to July 1, 2014. A summary list of these full-capture devices is included in Table QF-5-1. All devices listed within this table are enhanced trash control measures. Table QF-5-1 also includes the area treated and the calculated estimated trash load reduced from each full-capture treatment device. These calculations are consistent with the approach described in the *Trash Load Reduction Tracking Method Report* (BASMAA 2012b).

## Percent Reduction from Enhancements

The total estimated annual volume of trash that will be reduced by July 1, 2014 as a result of implementing full capture devices is 609 gallons. This volume is equal to approximately a 2.4 percent reduction in the baseline trash load to urban creeks from the municipal separate storm sewer system (MS4) owned and operated by the City of Berkeley. Both values provided within this section are included in Trash Load Reduction Summary Table included in Section 5.

**Table QF-6-1. Trash full-capture treatment devices within the jurisdictional boundaries of the City of Berkeley that are planned for installation by July 1, 2014.**

| Device ID | Public or Private | Device Name | Location (Cross Streets) | Installation Date/Anticipated Installation Date | Total Area Treated (acres) | Trash Load Reduced |
|---|---|---|---|---|---|---|
| 38 devices | *Public* | *Connector Pipe Screen (West Coast Storm)* | Retail/Wholesale Areas | June 30, 2014 | 44.8 | 343 gallons |
| 12 devices | Public | *Connector Pipe Screen (West Coast Storm)* | K-12 Schools Areas | June 30, 2014 | 14.1 | 48 gallons |
| 35 devices | Public | *Connector Pipe Screen (West Coast Storm)* | Commercial/Industrial Areas | June 30, 2014 | 41.2 | 74 gallons |
| 25 devices | Public | *Connector Pipe Screen (West Coast Storm)* | High Density Residential Areas | June 30, 2014 | 29.5 | 129 gallons |
| 40 devices | Public | *Connector Pipe Screen (West Coast Storm)* | Low Density Residential Areas | June 30, 2014 | 47.1 | 15 gallons |

# 5.0 SUMMARY OF TRASH CONTROL MEASURE ENHANCEMENTS

The City of Berkeley is committed to reducing the potential for trash impacts in local water bodies in the San Francisco Bay Area. The planned enhanced trash control measures described in Section 4.0 are also listed in Table 5-1. The enhancements are intended to comply with the 40% trash load reduction goal in MRP provision C.10.

**Table 5-1. Planned enhanced trash control measure implementation within the jurisdictional boundaries of the City of Berkeley and associated trash loads reduced.**

| Trash Control Measure | Summary Description of Control Measure | % Reduction (Credits) | Trash Load Reduced | Cumulative % Reduction (Compared to Baseline) |
|---|---|---|---|---|
| Existing Enhanced Street Sweeping | Retail areas swept >1/week | 6.3 | 1,602 | 6.3 |
| Single-use Carryout Plastic Bag Ordinance (CR-1) | Implement StopWast.org Ordinance | 8.0 | 1,892 | 13.8 |
| Polystyrene Foam Food Service Ware Ban (CR-2) | Implemented 1990 | 8.0 | 1,892 | 21.3 |
| Public Education and Outreach Programs (CR-3) | Participate with ACCWP | 6.0 | 1,419 | 26.9 |
| Activities to Reduce Trash from Uncovered Loads (CR-4) | City uses covered trucks, will implement uncovered load enforcement | 5.0 | 1,183 | 31.6 |
| Improved Trash Bin/Container Management (Municipally or Privately-Controlled) (CR-6) | Monitor for adequate service, support BIDs and litter service | 6.8 | 1,600 | 38.0 |
| Full-capture Treatment Devices (QF-5) | Install 150 devices | NA | 609 | 40.4 |

## 5.1 Annual Reporting and Progress Towards Trash Load Reduction Goal(s)

Consistent with MRP Provision C.10.d (i), the City of Berkeley intends to report on progress towards MRP trash load reduction goals on an annual basis beginning with the Fiscal Year 2011-2012 Annual Report. Annual reports will include:

1. A brief summary of all enhanced trash load reduction control measures implemented to-date;
2. The dominant types of trash likely removed via these control measures;
3. Total trash loads removed (credits and quantifications) via each control measure implementation; and
4. A summary of progress towards trash load reduction goals.

Similar to other MRP provision, annual reporting formats will be consistent region-wide. Annual reports are intended to provide a summary of control measure implementation and assess progress toward MRP trash reduction goals. For more detailed information on specific control measures, the City of Berkeley will retain supporting documentation on trash load reduction control measure implementation. These records should have a level of specificity consistent with the trash load reduction tracking methods described in the *BASMAA Trash Load Reduction Tracking Method Technical Report* (BASMAA 2012b).

## 5.2 Considerations of Uncertainties

Baseline trash loading and load reduction estimates are based on the best available information at the time this Short-Term Plan was developed. As with any stormwater loading and reduction estimate, a number of assumptions were used during calculations and therefore uncertainty is inherent in the baseline trash load estimate presented in Section 2.0 and the load reduction estimate presented in this section. For these reasons, the baseline loading estimates presented in this plan should be considered first-order estimates. During the implementation of this Short-Term Plan and subsequent plans, additional information may become available to allow the calculation of a more robust baseline load.

# 6.0 IMPLEMENTATION SCHEDULE

Implementation of enhanced trash control measures by the City of Berkeley is currently planned to occur in a timeframe consistent with MRP requirements. A preliminary implementation schedule for all planned enhancements is described in Table 6-1. This schedule provides a timeframe for reducing trash discharged from the City of Berkeley's MS4 by 40%.

Based on new information that becomes available during the implementation of this Short-Term Plan (e.g., revisions to baseline loading estimates or load reduction credits of quantification formulas), the City of Berkeley may chose to amend or revise this Plan and/or the associated implementation schedule. If revisions or amendments occur, a revised Short-Term Plan and implementation schedule will be submitted to the Water Board via the City of Berkeley's annual reporting process.

**Table 5-1. Preliminary implementation schedule for enhanced trash control measures in the City of Berkeley.**

| Trash Control Measure | Beginning Date of Implementation |
|---|---|
| Single-use Carryout Plastic Bag Ordinance (CR-1) | Jan 1, 2013 |
| Polystyrene Foam Food Service Ware Ban (CR-2) | Pre-MRP |
| Public Education and Outreach Programs (CR-3) | Pre-MRP |
| Activities to Reduce Trash from Uncovered Loads (CR-4) | Jun 30, 2014 |
| Improved Trash Bin/Container Management (Municipally or Privately-Controlled) (CR-6) | Pre-MRP |
| Enhanced Street Sweeping (QF-2) | Pre-MRP |
| Full-capture Treatment Devices (QF-5) | Jun 30, 2014 |

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